The University of Minnesota held the QuarkNet workshop on the dates of May 17th 2012, July 23rd-25th 2012 and August 12th-13th 2012. On May 17th we held the introductory day for the new QN. In addition to the lead teachers, Jon Anderson and Shane Wood, 15 teachers participated in the workshop with 13 teachers attending for the first time. Jon and Shane prepared an active agenda.

The workshop was held at the University of Minnesota's physics building and Dan Cronin-Hennessy and Jody Kaplan hosted for the university. I met with the QuarkNet teachers during the workshop and arranged for meetings with other HEP faculty. The agenda covered a number of areas from current hot research areas to pedagogical approaches in the classroom. On the first day Jon and Shane presented an introduction to the goals and workings of QuarkNet. This was followed by an introduction to the Standard Model. Subsequent days included presentations on accelerators and detectors. Shane wood introduced the teachers to the MastersClass program that he runs in association with the University of Minnesota. During one session of the workshop the teachers analyzed the data from the LHC experiment by examining event displays. Following this our teachers met with teachers at Purdue using standard high energy physics conferencing software to discuss and compare results of their analyses. Jon and Shane continued the tradition of "curriculum swap" at this years workshop. In this activity the teachers present their pedagogical approaches to teaching their students physics. A new element was introduced this year which Jon and Shane referred to as "group synthesis/whiteboard". The teachers would periodically gather in groups to prepare questions and comments on what they had seen. I thought this was an effective method of communicating questions to me because a) the questions were well thought out before asked and b) I could go to the whiteboards well before I had to answer and there fore had time to answer effectively.

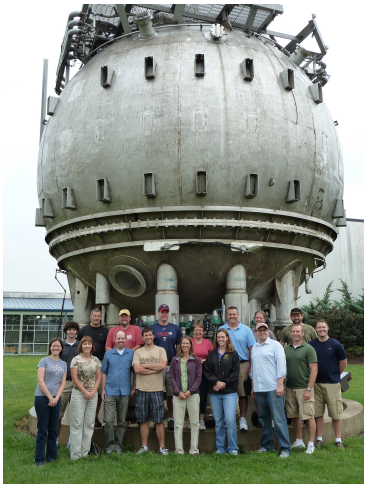
Integral to the success of the QuarkNet program is the time offered by our Minnesota faculty, students and staff. We had lunch talks from Yuichi Kubota (CMS), John Broadhurst (Particle Physics in Medicine) and Hans Courant (History of the Bomb).

Again this year we had an opportunity to show the teachers a particle physics detector under construction. The teachers visited the NOνA module factory where we are fabricating the basic detector components for a 12-kton neutrino detector. The teachers also attended our annual physics demo show. Our physics demonstration expert displayed many of his most impressive demonstrations.

On the dates of August 12 and 13, the entire group attended the annual trip which was at Fermilab again this year.

This was another productive year for QuarkNet at Minnesota. The lead teachers, Jon and Shane, are especially deserving of recognition for a wonderful success.

D. Cronin-Hennessy,
Associate Professor of Physics, University of Minnesota



QuarkNet teachers visit fermilab

QN Agenda

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2012 University of Minnesota QN Workshop Schedule & Topics

*Meet in **Tate Hall Room 130** unless otherwise noted.*

Monday, July 23, 2012

9:30 – 10:00	Coffee and Daily Opener (Jon, Shane, Dan, Ken)
10:00 – 10:15	Revisit (& add to?) questions posed during May meeting
10:15 – 11:15	Review of Standard Model (Dan)
11:15 – 11:30	BREAK
11:30 – 12:00	Group synthesis/whiteboard – Review of Standard Model
12:00 – 1:00	Day 1 of Lunch Lecture/Discussion Series (Topic?, Name?)
1:00 – 1:15	Q&A/BREAK
1:15 – 2:00	Introduction to Accelerators (Jon)
2:00 – 2:15	Cloud Chamber Demo (Location?, Name?)
2:15 – 3:00	Introduction to Detectors (Shane)
3:00 – 3:10	BREAK
3:10 – 3:30	Group synthesis/whiteboard – Accelerators and Detectors
3:30 – 4:00	End of Day Discussion/Wrap-up (Ken, Dan, Jon, Shane)

Tuesday, July 24, 2012

9:30 – 9:45	Coffee and Daily Opener (Jon & Shane)
9:45 – 10:30	PPM – Part 1: Introduction to Particle Physics Masterclass (Shane)
10:30 – 12:00	Curriculum Swap (Jon), QN Classroom Activities (Shane) – BREAK as needed
12:00 – 1:00	Day 2 of Lunch Lecture/Discussion Series (Topic?, Name?)
1:00 – 1:15	Q&A/BREAK
1:30 – 2:30	U of M – Physics Demos (Brian Andersson, Large Lecture Hall (Room 150?))
2:30 – 2:45	BREAK
2:45 – 3:30	PPM – Part 2: Particle Physics Masterclass – Begin Data Analysis (Shane)
3:30 – 4:00	End of Day Discussion/Wrap-up – FACTORY DIRECTIONS (Ken, Dan, Jon, Shane)

Wednesday, July 25, 2012

9:30 – 10:30	NOvA Detecotor Factory Tour (OFF SITE – Factory)
10:30 – 11:00	Park/Return to Tate Hall
11:00 – 11:45	MINOS/NOvA (Dan?)
11:45 – 12:00	Group synthesis/whiteboard – MINOS/NOvA
12:00 – 1:00	Day 3 of Lunch Lecture/Discussion Series (Topic?, Name?)
1:00 – 1:15	Q&A/BREAK
1:15 – 3:00	PPM – Part 3: Masterclass Data Analysis, Discussions, Conclusions (Shane & Dan)
3:00 – 3:30	Fermilab Pre-Tour Information (Jon)
3:30 – 4:00	End of Day Discussion/Wrap-up (Ken, Dan, Jon, Shane)

Sunday-Monday, August 12-13, 2012

Trip to Fermilab – See Back Side